Mental health of UK Armed Forces medical personnel post-deployment

P. Cawkill[1], M. Jones[2], N. T. Fear[3], N. Jones[3], M. Fertout[4], S. Wessely[3] and N. Greenberg[3]

[1]Human Systems Group, Defence Science and Technology Laboratory, Portsdown West PO17 6AD, UK, [2]King's Centre for Military Health Research, King's College London, Institute of Psychiatry, London SE5 9RJ, UK, [3]Academic Department of Military Mental Health, King's College London, Institute of Psychiatry, London SE5 9RJ, UK, [4]Department of Community Mental Health, Tidworth SP9 7EA, UK.

Correspondence to: N. Greenberg, Academic Department of Military Mental Health, King's College London, Institute of Psychiatry, Weston Education Centre, 10 Cutcombe Road, London SE5 9RJ, UK. Tel: +44 (0)207 848 5351; e-mail: neil.greenberg@kcl.ac.uk

Background	The mental health effects of deployment vary widely, and personnel in both combat and combat support roles, including medical personnel, may be adversely affected.
Aims	To compare the mental health of deployed UK military medical staff in both forward and rear locations and to compare these two groups with other deployed military personnel.
Methods	Participants were medics who had deployed to Iraq or Afghanistan and provided information about their deployed role, experiences during and on return from deployment and demographic and military factors. Health outcomes included common mental health problems (using 12-item General Health Questionnaire), post-traumatic stress disorder (PTSD, using 17-item Post-Traumatic Stress Disorder Checklist—Civilian Version), multiple physical symptoms and alcohol use (using 10-item Alcohol Use Disorders Identification Test).
Results	The sample comprised 321 medical personnel. The response rate was 56%. The mental health outcomes for forward located medics (FMs) were no different than those for rear located medics (RLMs). When comparing FMs and RLMs against all other military roles, a small but significant increase in PTSD symptoms in FMs was found. FMs were more likely to rate their work while deployed as being above their skills and experience, report exposure to more combat experiences and report a more challenging homecoming experience than RLMs.
Conclusions	These results suggest that while the overall rates of self-reported mental health disorders were similar in FMs and RLMs, FMs reported more PTSD symptoms than all other roles, which may have been related to working in more hostile environments in more challenging roles while deployed and their experiences on returning home.
Key words	Mental health; military medics; operational deployment.

Introduction

Research suggests that mental health effects of deployment vary widely and are related to many factors, e.g. length of deployment, high intensity combat and frequent tours. Combat or combat support roles, including medical personnel, may be adversely affected by their deployment experiences [1–6]. Civilian paramedical staff exposed to single incidents such as bombings, acts of terrorism or sniper shootings report high levels of stress, depression, post-traumatic stress symptoms, burnout and suicidal ideation [7–10]. Multiple exposures, e.g. missile attacks in Israel, showed that civilian hospital personnel reported more depression symptoms compared to studies of singular traumatic incident exposures [11], especially with perceived poor support and/or inadequate supervision or low morale [12].

To date, only one study has evaluated the mental health of UK military medical staff in relation to deployment. Jones *et al.* [5] found that UK medical personnel (medics) reported higher levels of psychological distress and multiple physical symptoms post-deployment compared with other deployed military trades related to traumatic medical experiences (e.g. giving aid to the wounded, handling bodies, etc.), lower group cohesion

and preparedness and challenging post-deployment experiences [5].

However, Jones *et al.* did not take into account the location of medics during deployment, i.e. in either forward or rearward locations. Forward located medics (FMs) work in direct support of combat operations often from basic medical facilities in small teams composed mostly of medical technicians who have received advanced life support training. FMs provide immediate life support and assist in rapid casualty evacuation to more comprehensive medical facilities [13]. FMs often accompany combat troops on patrol, thereby sharing the same exposure to danger as the troops they are directly supporting. Medics working in rearward locations (RLMs) are often located in large installations called field hospitals, which are usually situated in main base areas away from direct combat operations. RLMs are generally exposed to lower levels of personal threat, although some rear locations may be targeted by indirect fire (e.g. rockets). While all military medics deploy with personal weapons (e.g. rifles), and are expected to use them if necessary, the likelihood of actually doing so is much higher for FMs than RLMs.

This study examines the mental health of FMs compared with RLMs and also compares FMs and RLMs with other deployed military personnel. It was hypothesized that because FMs witness traumatic events to others (e.g. death and serious injuries) and threats to personal safety (e.g. incoming enemy fire), they would be at greater risk of developing mental health problems, e.g. post-traumatic stress disorder (PTSD) [14] than RLMs. Given the results of previous studies, it was hypothesized that the mental health problems of both FMs and RLMs would be poorer than other deployed military trades/specializations.

Methods

The data used in this study were collected as part of a cohort study to compare the mental and physical health of UK Armed Forces personnel, who deployed on operation to Iraq (Op TELIC) or Afghanistan (Op HERRICK) with personnel not deployed on either operation [2]. Phase 1 of the study, initiated in 2004, comprised a random sample of personnel deployed to Iraq in 2003 (Telic sample) and a random sample of personnel who were in the military but had not deployed to Iraq at that time (era sample) [4]. Between November 2007 and September 2009, those who completed the questionnaire in Phase 1 were re-contacted (Phase 2). Another two samples were added at Phase 2. First, a random sample of those deployed to Afghanistan between April 2006 and April 2007 in response to the expansion of the military operation

in Afghanistan. Second, a random sample of personnel who had joined the UK Armed Forces after the start of the Phase 1 study and had completed training between April 2003 and April 2007 and could therefore have deployed to Iraq or Afghanistan in the period under consideration. This sample was added to ensure that the demographic characteristics of the study continued to reflect the current composition of the UK Armed Forces. The sample included: service leavers, full-time regulars and reservists. There was no association between responding at Phase 2 and baseline mental health outcomes [1]. Ethical approval for both phases of the cohort study was granted by the Ministry of Defence Research Ethics Committee and the King's College Hospital local research ethics committee.

Only those deployed to Iraq or Afghanistan are included in the analysis reported here. Participants were asked to indicate their main duty during deployment from a list of 20 options such as combat, medical, logistics/supply, aircrew, engineering, intelligence and communications. The Phase 2 questionnaire allowed those with a medical role to indicate a forward role or rear location role. UK Armed Forces medical staff (referred to collectively as medics) includes doctors, nurses and medical support personnel. The non-medical comparison group included all other roles.

Participants provided information about their deployment including potentially traumatic experiences, unit cohesion, whether they deployed with their parent unit and if work in theatre matched or was above or below their trade experience and ability. Traumatic combat experiences and traumatic medical experiences were assessed using a combat exposure scale (CES). Participants indicated how often they encountered each exposure (exposures included 'come under small arms/rocket propelled grenade fire', 'discharge your weapon in direct combat' and 'give aid to the wounded'). The responses were dichotomized to never or ever to calculate the frequency of exposure to each item. In addition, a total score of traumatic combat experience was calculated from 10 combat items of the CES. The maximum score for each item was 10. Binary variables were constructed from questions about unit support, including comradeship and unit cohesion, which had five response options. Having major problems on return from deployment, feeling well supported by the military and finding it difficult to adjust to being back home were single questions with possible responses of agree or disagree.

The mental health measures included: the 12-item General Health Questionnaire (GHQ-12) that measures symptoms of common mental health disorders [15]; the 17-item Post-Traumatic Stress Disorder Checklist—Civilian Version (PCL-C), used in preference to the military version (PCL-M) because it is less restrictive in a population that may have suffered traumatic events

unrelated to deployment activities [16]; a 53-item somatic symptoms checklist [1,3]; the 10-item Alcohol Use Disorders Identification Test (AUDIT) [17]. Cases of common mental health disorder were defined as individuals endorsing four or more for the GHQ-12, probable PTSD in those scoring 50 or more for the PCL-C and occupationally impairing PTSD symptoms as a PCL cut-off of 30+, which was utilized in this study as previous work has indicated that even low level traumatic stress symptoms can be associated with functional impairment (symptoms in the cut-off range 30–49 are sometimes referred to as sub-threshold PTSD) [18]. We used a score of 18 or more as caseness on the somatic symptoms checklist and 16 or more for alcohol misuse on the AUDIT.

Multivariable logistic regression was used to assess the association between role during deployment and each mental health outcome adjusting for sex, age, education, marital status, service, rank and enlistment type and additionally for traumatic combat experiences score and having 'major problems on return from deployment'. Weights were created to account for sampling fractions and to account for response bias [1]. Sample weights reflected the inverse probability of a subject from a given sub-population (Phase 1 TELIC, Phase 1 era, Phase 2 HERRICK, Phase 2 replenishment) and given regular–reservist status being sampled, this probability varies by sub-population and regular–reservist status. Response weights were defined as the inverse probability of responding once sampled and driven by factors shown empirically to predict response (sex, rank, engagement type, age, sample and the interaction between sample and engagement type). All analyses presented here used the survey commands in STATA v11.2. Weighted percentages, odds ratios (ORs) and 95% confidence intervals (CIs) are presented with unweighted cell counts.

Results

Of the 9984 Phase 2 responders, 4971 had been deployed to Iraq and/or Afghanistan. Fifty-nine respondents did not report their role in theatre during deployment giving a total of 4912 available for analysis. The response rate was 56%. Responders were more likely to be older, female, officers, regulars and those who participated in the first phase of the study. Of the 4912 participants, 5% (321) had a medical role (129 FMs and 192 RLMs) and 94% (4591) were in 'other' roles. Of the other roles, 26% (1180) indicated that their role was combat, and the remaining 74% were non-combat. Medics were more likely to be officers, reservists, female, older, single and of higher educational standard than those in other roles. FMs were more likely to be regulars, of lower rank and younger, when compared with RLMs (Table 1).

FMs were significantly less likely than RLMs to feel that the work asked of them while deployed matched their trade experiences and abilities, although this difference was small (77 versus 81%). Nearly 22% of FMs felt that the work in theatre was generally above their trade and experience when compared with 11% of RLMs (Table 2).

FMs were, in general, more likely to endorse the traumatic combat experiences (Table 2) and to report having spent time outside the base in a hostile area than RLMs. With regards to traumatic medical experiences, FMs were significantly more likely than RLMs to have given aid to the wounded (88 versus 75%), there was no significant difference with respect to handling bodies or seeing personnel seriously wounded or killed. FMs and RLMs reported similar levels of unit support, although FMs were significantly more likely to have deployed with their parent unit (52 versus 31%).

Compared with medics, other roles were significantly more likely to have spent time outside the base in a hostile area (72 versus 55%), cleared or searched buildings/caves (31 versus 19%), experienced an improvised explosive device (27 versus 16%), encountered sniper fire (19 versus 8%) and discharged their personal weapon in direct combat (19 versus 11%). Medics were significantly more likely to have given aid to the wounded (80 versus 23%), to have handled bodies (62 versus 16%) and to have seen personnel seriously wounded or killed (83 versus 45%). In addition, other roles were significantly more likely to have deployed with their parent unit (63 versus 40%). FMs were significantly more likely to report experiencing major problems on their return home (37 versus 17%) and had difficulty adjusting to being back home (49 versus 34%) than RLMs.

There was no difference in self-reported mental health outcomes between FMs and RLMs, with the exception that FMs reported higher levels of alcohol misuse (unadjusted OR 2.75, 95% CI 1.19–6.39) and were more likely to report functionally impairing PTSD symptoms (unadjusted OR 2.36, 95% CI 1.17–4.74) (Table 3). However, these findings became non-significant after adjustment for demographic factors. Traumatic combat exposure and major problems on return from deployment were a plausible explanation for the association with alcohol misuse and PTSD symptoms. FMs reported significantly higher PCL scores than RLMs; mean PCL score for FMs was 27.5, whereas for RLMs it was 22.2 ($t = 4.79$, $P < 0.001$).

No statistically significant differences were found in the number of medics suffering from mental health disorders when comparing FMs and RLMs separately against all other roles. However, when using the PCL lower cut-off score of >30 (functionally impairing PTSD symptoms), there was a significant difference between FMs and all other roles (Table 4) that remained

Table 1. Socio-demographic and military characteristics of FMs, RLMs and all other roles (overall $n = 4912$)

	Other roles ($n = 4591$), n (%)	All medics ($n = 321$), n (%)	P^a	FMs ($n = 129$), n (%)	RLMs ($n = 192$), n (%)	P^b
Service			NS			NS
Naval Service	437 (9)	39 (12)		19 (13)	20 (11)	
Army	3278 (73)	225 (70)		90 (71)	135 (69)	
RAF	876 (18)	57 (18)		20 (16)	37 (20)	
Rank			<0.001			<0.05
Officer	881 (16)	130 (33)		34 (26)	96 (39)	
Non-commissioned officer	2620 (64)	154 (54)		72 (55)	82 (53)	
Other	1090 (20)	37 (13)		23 (20)	14 (8)	
Enlistment type			<0.001			<0.01
Regular	4192 (95)	232 (83)		110 (91)	122 (77)	
Reserve	399 (5)	89 (17)		19 (9)	70 (23)	
Sex			<0.001			NS
Male	4289 (94)	201 (64)		88 (69)	113 (60)	
Female	302 (6)	120 (36)		41 (31)	79 (40)	
Age group (years)			<0.001			<0.001
<25	989 (18)	34 (10)		15 (10)	19 (9)	
25–29	1084 (24)	78 (26)		48 (40)	30 (16)	
30–34	884 (21)	57 (21)		29 (23)	28 (19)	
35–39	836 (20)	62 (20)		19 (14)	43 (25)	
40+	798 (17)	90 (24)		18 (13)	72 (32)	
Marital status			<0.001			NS
Married/co-habiting	3424 (77)	211 (66)		84 (64)	127 (68)	
Single/ex relationship	1141 (23)	108 (34)		44 (36)	64 (32)	
Educational qualifications			<0.001			NS
None or O-level	2118 (51)	83 (31)		46 (37)	37 (26)	
A-level or degree	2332 (49)	223 (69)		80 (63)	143 (74)	

NS, not significant. Percentages are weighted to account for sampling differences and differential response weights. Numbers may not add up to the totals due to missing data.
[a]Pearson's chi-square test comparing all medics to all other roles.
[b]Pearson's chi-square test comparing FMs to RLMs.

significant after adjustment for demographic factors (adjusted OR 1.83, 95% CI 1.14–2.92) but became non-significant after adjustment for combat exposures and homecoming experiences. The marked reduction in OR after adjustment for major problems on return from deployment (OR 1.14, 95% CI 0.64–2.03) indicates that this variable may explain a substantial proportion of the difference.

Discussion

This study found no significant differences in the rates of mental health disorders when comparing FMs and RLMs and when comparing each to other military roles. There was some evidence that the mental health of FMs was marginally poorer in terms of PTSD symptoms compared with other military roles. Additionally, there were some significant differences between FM and RLMs in terms of reporting PTSD symptoms and alcohol misuse; however, these differences became non-significant when adjusting for confounders. Deployed FMs were more likely to report working above their skills and experience, greater exposure to combat experiences and having experienced a poorer homecoming than RLMs.

Differences between our findings and those of Jones et al. [5], who found higher levels of psychological distress, multiple physical symptoms and higher fatigue (in men) in medics compared with other deployed military roles, are of interest. Unlike Jones et al. [5], we found no compelling evidence for an excess of mental ill-health among medics as a whole compared with other troops. Whether this difference is because of changes to the way medical personnel are deployed or because of the additional mental health support mechanisms introduced for all military personnel in recent years, e.g. peer support [19] and decompression [20], is unclear.

While no significant differences in the rates of mental disorders were found, FMs were significantly more likely to be sub-threshold PTSD cases than either RLMs or personnel in other roles. There was some indication that FMs were more likely to report post-deployment alcohol misuse, and there is a supporting literature relating to increased alcohol intake in military personnel post-deployment [21–23]. However, adjustment

Table 2. Deployment and post-deployment experiences for FMs, RLMs and other roles

	Other roles (*n* = 4591), *n* (%)	All medics (*n* = 321), *n* (%)	*P*[a]	FMs (*n* = 129), *n* (%)	RLMs (*n* = 192), *n* (%)	*P*[b]
Work in theatre			<0.05[c]			<0.05
Generally matched trade and experience	3768 (84)	267 (79)		100 (77)	167 (81)	
Was generally above trade and experience	415 (9)	35 (16)		23 (22)	12 (11)	
Was generally below trade and experience	353 (7)	16 (5)		3 (2)	13 (7)	
Traumatic combat experiences						
Time spent outside the base in a hostile area	3228 (72)	158 (55)	<0.001	99 (83)	59 (35)	<0.001
Experienced hostility from local civilians	2031 (47)	119 (41)	NS	66 (55)	53 (30)	<0.001
Cleared or searched buildings/caves	1321 (31)	62 (19)	<0.001	43 (32)	19 (11)	<0.001
Came under mortar/artillery fire/rocket attack	3489 (78)	230 (78)	NS	106 (87)	124 (71)	<0.01
Came under small arms/RPG fire	2212 (50)	117 (42)	<0.05	81 (70)	36 (20)	<0.001
Experienced a landmine strike	507 (11)	28 (9)	NS	26 (19)	2 (2)	<0.001
Experienced an IED	1137 (27)	48 (16)	<0.001	43 (31)	5 (5)	<0.001
Encountered sniper fire	820 (19)	29 (8)	<0.001	24 (18)	5 (1)	<0.001
Experienced a threatening situation but was unable to respond due to rules of engagement	909 (21)	33 (13)	<0.01	28 (25)	5 (3)	<0.001
Discharged personal weapon in direct combat	888 (19)	31 (11)	<0.01	27 (20)	4 (4)	0.001
Believed to be in serious danger of being injured or killed	3840 (85)	253 (83)	NS	117 (94)	136 (75)	0.001
Had a mate shot/hit who was nearby	644 (15)	36 (12)	NS	30 (21)	6 (5)	<0.01
Traumatic medical experiences						
Saw personnel seriously wounded or killed	1985 (45)	264 (83)	<0.001	102 (78)	162 (87)	NS
Gave aid to the wounded	979 (23)	257 (80)	<0.001	111 (88)	146 (75)	<0.05
Handled bodies	743 (16)	208 (62)	<0.001	81 (61)	127 (63)	NS
Unit support						
Deployed with parent unit	2819 (63)	130 (40)	<0.001	68 (52)	62 (31)	<0.01
Felt comradeship with others in the unit	3951 (87)	270 (85)	NS	112 (89)	158 (81)	NS
Could go to most people in the unit with a personal problem	2648 (58)	172 (53)	NS	74 (59)	98 (48)	NS
Seniors interested in what I did or thought	3011 (66)	218 (65)	NS	85 (65)	133 (66)	NS
Felt well informed about what was going on	3138 (69)	216 (65)	NS	79 (59)	137 (69)	NS
Post-deployment experience						
Had major problems on return	802 (18)	79 (26)	<0.05	44 (70)	35 (17)	<0.01
Felt well supported by the military	3090 (70)	189 (60)	<0.01	71 (56)	118 (62)	NS
Found it difficult to adjust being home	1410 (31)	124 (40)	<0.01	60 (49)	64 (34)	<0.05

IED, improvised explosive device; NS, not significant; RPG, rocket propelled grenade. Percentages are weighted to account for sampling differences and differential response rates. Numbers may not add up to the totals due to missing data.
[a]Pearson's chi-square test comparing all medics to all other roles.
[b]Pearson's chi-square test comparing FM to RLM.
[c]*P* values for work in theatre are based on the total value derived from summing the three option responses encompassed within a single question.

for demographic factors led to this finding becoming non-significant.

FMs reported statistically significant greater exposures to traumatic situations than RLMs. We found adjustment for the level of traumatic combat experiences explained some of the differences in sub-threshold PTSD. Notably, many FMs also believed they were in serious danger of being injured or killed. Our data suggest that differences between FMs and RLMs may result from experiencing major problems on returning home. It is possible that experiencing problems at home may have been a result of the increased reporting

of PTSD symptoms, such as irritability, which might impair adjustment or because the particular challenges of FMs adjusting from their in theatre roles that were more distinct from their home role than would have been the case for RLMs. As this was a cross-sectional study, it is difficult to ascertain whether adjustment causes symptoms or the symptoms interfere with adjustment. It might be that FM personnel who had engaged in carrying out medical procedures under arduous conditions in theatre may find adjusting to highly controlled routine normal medical practice difficult to deal with. RLMs, on the other hand, are likely

Table 3. Association between probable mental health disorders and role on deployment for FMs and RLMs

	n (%)	Unadjusted OR (95% CI)	Adjusted OR[a] (95% CI)	Adjusted OR[b] (95% CI)	Adjusted OR[c] (95% CI)
PCL (50+)					
RLMs	3 (3)	1.00			
FMs	9 (5)	1.99 (0.44–9.03)			
PCL (30+)					
RLMs	28 (15)	1.00	1.00	1.00	1.00
FMs	40 (30)	2.36 (1.17–4.74)	1.66 (0.79–3.50)	0.99 (0.43–2.28)	1.24 (0.57–2.66)
GHQ-12 (4+)					
RLMs	33 (21)	1.00	1.00	1.00	1.00
FMs	27 (22)	1.08 (0.54–2.19)	1.15 (0.51–2.59)	0.90 (0.37–2.18)	0.92 (0.40–2.14)
Multiple physical symptoms (18+)					
RLMs	11 (7)	1.00	1.00	1.00	1.00
FMs	13 (14)	2.07 (0.73–5.86)	2.26 (0.69–7.45)	2.46 (0.74–8.19)	1.97 (0.58–6.66)
AUDIT (16+)					
RLMs	16 (10)	1.00	1.00	1.00	1.00
FMs	25 (23)	2.75 (1.19–6.39)	1.71 (0.66–4.40)	1.17 (0.39–3.54)	1.67 (0.68–4.09)

Percentages are weighted to account for sampling differences and differential response rate.
[a]Adjusted for sex, age (continuous), educational qualification, marital status, service, rank, enlistment type (regular or reserve).
[b]Adjusted for service and demographic variables and additionally for combat exposure score (continuous).
[c]Adjusted for service and demographic variables and additionally for major problems on return from deployment (binary).

Table 4. Association between probable mental health disorders and role on deployment: comparing medics to all other roles

	n (%)	Unadjusted OR (95% CI)	Adjusted OR[a] (95% CI)	Adjusted OR[b] (95% CI)	Adjusted OR[c] (95% CI)
PCL (50+)					
All other roles	170 (4)	1.00	1.00	1.00	1.00
FMs	9 (5)	1.25 (0.59–2.65)	1.25 (0.53–2.93)	1.09 (0.44–2.67)	0.78 (0.28–2.19)
RLMs	3 (3)	0.63 (0.17–2.37)	0.70 (0.17–2.92)	0.87 (0.20–3.74)	0.77 (0.18–3.30)
PCL (30+)					
All other roles	800 (19)	1.00	1.00	1.00	1.00
FMs	40 (30)	1.83 (1.17–2.87)	1.83 (1.14–2.92)	1.49 (0.90–2.47)	1.14 (0.64–2.03)
RLMs	28 (15)	0.78 (0.45–1.34)	0.86 (0.47–1.58)	1.04 (0.58–1.88)	0.89 (0.45–1.75)
GHQ-12 (4+)					
All other roles	848 (19)	1.00	1.00	1.00	1.00
FMs	27 (22)	1.19 (0.71–2.01)	1.03 (0.60–1.76)	0.96 (0.55–1.74)	0.81 (0.45–1.43)
RLMs	33 (21)	1.10 (0.68–1.79)	0.98 (0.58–1.62)	1.04 (0.62–1.74)	1.03 (0.60–1.77)
Multiple physical symptoms (18+)					
All other roles	346 (9)	1.00	1.00	1.00	1.00
FMs	13 (14)	1.67 (0.86–3.27)	1.73 (0.84–3.56)	1.45 (0.65–3.23)	1.41 (0.64–3.15)
RLMs	11 (7)	0.81 (0.36–1.82)	0.76 (0.32–1.81)	0.88 (0.37–2.10)	0.80 (0.33–1.94)
AUDIT (16+)					
All other roles	754 (16)	1.00	1.00	1.00	1.00
FMs	25 (23)	1.49 (0.88–2.51)	1.65 (0.93–2.92)	1.52 (0.85–2.73)	1.46 (0.79–2.72)
RLMs	16 (10)	0.54 (0.28–1.05)	0.96 (0.46–2.00)	1.03 (0.50–2.14)	1.02 (0.49–2.16)

Percentages are weighted to account for sampling differences and differential response weights.
[a]Adjusted for sex, age (continuous), educational qualifications, marital status, service, rank, enlistment type (regular or reserve).
[b]Adjusted for service and demographic variables and additionally for combat exposure score (continuous).
[c]Adjusted for service and demographic variables and additionally for major problems on return from deployment (binary).

to have worked in a purpose-built medical facility and had access to more sophisticated medical support during the deployment. This would have allowed them to re-adapt to UK standard clinical governance processes more easily than FMs who while adhering closely to clinical governance practices, would have had to adapt their usual practice to the austere surroundings in which they worked [24,25].

Our results suggest at most a modest adverse health effect for medical personnel who deploy in forward roles. Medics are supported through established and well-defined processes that aim to minimize psychological impacts upon deployed personnel. These include pre-deployment briefings, through-deployment support by deployed medical and mental health professionals [26], the use of trauma risk management [19,27] post-incident peer support and a variety of post-deployment support processes including third location decompression [20]. All UK military returnees receive at least two mental health briefings designed to aid readjustment that appear to be effective [28]. However, how effective these support processes might be for medical personnel is unclear. Since evidence shows that troops prefer to speak to colleagues they have deployed with about mental health issues [29], re-adjusting to a non-deployed environment may be more challenging for medics working in mainly National Health Service settings outside of the 'safe' canopy of the military environment.

The study has a number of limitations. The study was likely to be underpowered given the small number of cases, thereby making it more difficult to detect health outcomes for FMs and RLMs, although other studies of this nature have adopted a similar caseness outcome approach. A further weakness was that during deployment medics may work as part of a medical team, headed by a physician, or may be called upon to work fairly independently with limited medical backup, which this study was unable to address. Given the small sample size of the current study, further investigation into this topic is warranted within a study that is sufficiently powered to detect significant differences between the relevant groups (e.g. RLMs and FMs), though it is acknowledged that such specialized groups often only ever yield small sample sizes.

In conclusion, mental health status of medical personnel and those deploying in other military roles appears similar. However, we found some evidence suggesting that forward located medics, who deal with casualties without sophisticated medical support and face considerable personal threat, may suffer with more occupationally impairing PTSD symptoms. These may be related to difficulties with their homecoming experiences. While the results of this study should be treated with caution since they are derived from a small sample, there may be merit in re-examining the psychological support provision for FMs on return home and consider whether there is room for improvement. We suggest that medical unit commanders should ensure that both FMs and RLMs have access to the same level of support as the units that they deploy with and that potential stigma and care-seeking barriers are addressed [30]. Providing appropriate information and support to the workplaces where medics return to work may also be useful in off-setting potential re-adjustment difficulties, especially when returning to non-military places of work.

Key points

- The overall rates of self-reported mental health disorders in forward located medics were no different to those reported by rear located medics, although forward located medics reported higher levels of alcohol misuse than rear located medics and were more likely to report occupationally impairing post-traumatic stress disorder symptoms than personnel in all other roles.
- Re-adjustment to being at home appears to be a particular difficulty for forward located medics who also reported finding that their role on deployment was particularly likely to be above their usual skills and experience.
- Post-deployment mental health support, such as provision of information and extra vigilance from the medical unit commanders, may be helpful in assisting with medical troops' homecoming experiences.

Conflicts of interest

All authors were/are based at the Academic Department of Military Mental Health (ADMMH), King's College London (KCL) when this paper was written, except M.J. who was based with the King's Centre for Military Health Research (KCMHR), King's College London. Both Centres receive funding from the UK Ministry of Defence (MoD). P.C. is a member of the Defence Science and Technology Laboratory (Dstl), which is part of the MoD, and was seconded to KCL on a part-time basis. N.J. and M.F. are full-time members of the UK Armed Forces, and although paid directly by the UK MoD, they were not directed in any way by the MoD in relation to this publication. S.W. is Honorary Civilian Consultant Advisor in Psychiatry to the British Army and a Trustee of Combat Stress, a UK charity that provides services and support for veterans with mental health problems. All other authors declare they have no conflicts of interest.

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